UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
PREVENTION, PESTICIDES
AND
TOXIC SUBSTANCES

MEMORANDUM

SUBJECT: RED ECOLOGICAL EFFECTS REVIEW AND RISK ASSESSMENT

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Chemical Name: 1,4-bis(bromoacetoxy)-2-butene (BBAB)
DP Barcode: D251931, D251935 **Submission:** S553940
PC Codes: 035605 **EPA Reg. No.:** 1448-353
MRID's: 432301-01, 431910-01, 432045-01, 432142-01, 432142-02

SUMMARY:

BBAB has an LD50 of 196 mg/kg to avian species on an acute oral basis and is categorized as moderately toxic. The LC50 for BBAB is >5000 ppm and is categorized as practically nontoxic to avian species on a subacute dietary basis. BBAB has an LC50 which falls in the range of 0.025-0.057 ppm and is categorized as very highly toxic to freshwater fish on an acute basis. BBAB is also categorized as highly toxic to aquatic invertebrates on an acute basis with an EC50 of 0.14 ppm.

A risk assessment will not be conducted on BBAB based on the use patterns, the available data and chemical characteristics of the chemical. For the uses proposed for reregistration, the Agency is requiring data to: (a) have baseline toxicity data available in the event of a transportation spill; and (b) adequately label those products to be reregistered.

Acute toxicity testing with estuarine/marine fish and estuarine/marine invertebrates using the TGAI is required for BBAB. This data set is a requirement under Part 158, Subpart W and is required for labeling purposes. The Agency will consider the data as Confirmatory Data.

1. Ecological Toxicity Data

a. Toxicity to Terrestrial Animals

I. Birds, Acute and Subacute

An acute oral toxicity study using the technical grade of the active ingredient (TGAI) is required to establish the toxicity of 1,4-bis(bromoacetoxy)-2- butene to birds. The preferred test species is either mallard duck (a waterfowl) or bobwhite quail (an upland gamebird). Results of this test are tabulated below.

Avian Acute Oral Toxicity

Species	% ai	LD50(ppm)	Toxicity Category	MRID No. Author/Year	Study Classification
Mallard duck *(Anas platyrhynchos)*	82	196	moderately toxic	432142-02 Wildlife International, LTD/1994	Core

1,4-bis(bromoacetoxy)-2-butene has an LD50 of 196 mg/kg and is categorized as moderately toxic to avian species on an acute oral basis. The guideline (71-1/850.2100) is fulfilled (MRID 432142-01).

A subacute dietary study using the TGAI of 1,4-bis(bromoacetoxy)-2-butene may be required on a case-by-case basis depending on the results of lower tier ecological studies and pertinent environmental characteristics to establish the toxicity to birds. The preferred test species are mallard duck and bobwhite quail. Results of these tests are tabulated below.

Avian Subacute Dietary Toxicity

Species	% ai	5-Day LC50(ppm)	Toxicity Category	MRID No. Author/Year	Study Classification
Mallard duck *(Anas platyrhynchos)*	82	>5000	practically nontoxic	432142-02 Wildlife International, LTD/1994	Core

1,4-bis(bromoacetoxy)-2-butene has an LC50 is >5000 ppm and is categorized as practically nontoxic to avian species on a subacute dietary basis. The guideline (71-2(b)/850.2200) is fulfilled (MRID 432142-02).

b. Toxicity to Freshwater Aquatic Animals

I. Freshwater Fish, Acute

Two freshwater fish toxicity studies using the TGAI are required to establish the toxicity of 1,4-bis(bromoacetoxy)-2-butene to fish. However, testing with two species is required for stable chemicals with uses that typically have some effluent (e.g. including but not limited to, egg washing, fruit and vegetable rinses, swimming pools, or materials preservatives) and if the LC50 in the first species is greater than (>) 1 ppm. (A stable chemical could pass through a Public Owned Treatment Works (POTW) into nontarget waters. Therefore, data on another fish species is required to determine whether such a chemical is toxic to other species of aquatic vertebrates.) The preferred test species are rainbow trout (a coldwater fish) and bluegill sunfish (a warmwater fish). Results of these tests are tabulated below.

Freshwater Fish Acute Toxicity

Species/ Flow-through	% ai	LC50 (ppm)	Toxicity Category	MRID No. Author/Year	Study Classification
Rainbow trout *(Oncorhynchus mykiss)*	82	0.025	Very Highly Toxic	431910-01 Bettencourt, MJ/1994	Core
Bluegill sunfish *(Lepomis macrochirus)*	82	0.057	Very Highly Toxic	432301-01 Bettencourt, MJ/1994	Core

1,4-bis(bromoacetoxy)-2-butene has an LC50 which falls in the range of 0.025-0.057 ppm, and is categorized as very highly toxic to freshwater fish on an acute basis. The guideline (72-1/850.1750) is fulfilled (MRID#'s 431910-01, 432301-01).

II. Freshwater Invertebrates, Acute

A freshwater aquatic invertebrate toxicity test using the TGAI is required to establish the toxicity of 1,4-bis(bromoacetoxy)-2-butene to aquatic invertebrates. The preferred test species is *Daphnia magna*. Results of this test are tabulated below.

Freshwater Invertebrate Acute Toxicity

Species	% ai	EC50 (ppm)	Toxicity Category	MRID No. Author/Year	Study Classification
Waterflea *(Daphnia magna)*	82	0.14	Highly Toxic	432045-01 Putt, AE/1994	Core

1,4-bis(bromoacetoxy)-2-butene is categorized as highly toxic to aquatic invertebrates on an acute basis with an EC50 of 0.14 ppm. The guideline (72-2/850.1010) is fulfilled (MRID 432045-01).

c. Toxicity to Estuarine and Marine Animals

I. Estuarine/Marine Fish and Invertebrates, Acute

Acute toxicity testing with estuarine/marine animals using the TGAI is required for 1,4-bis(bromoacetoxy)-2-butene when products are used in operations (e.g., oil/gas operations) that are located in or near estuarine/marine environments. The preferred test species is sheepshead minnow. Results of these tests are tabulated below.

The guideline (72-3a/850.1025, 850.1035, 850.1045, 850.1055, 850.1075) is not fulfilled. These studies are required for reregistration.

2. Exposure and Risk Assessment

Risk assessment integrates the results of the exposure and ecotoxicity data to evaluate the likelihood of adverse ecological effects. A risk assessment will not be conducted on 1,4-bis(bromoacetoxy)-2-butene based on the use patterns, the available data and chemical characteristics of the chemical. For the uses proposed for reregistration, the Agency is requiring data to: (a) have baseline toxicity data available in the event of a transportation spill; and (b) adequately label those products to be reregistred.

3. Endangered Species

For the uses proposed for reregistration, the Agency has not conducted an environmental risk assessment and has not calculated endangered species LOC's. However, the Endangered Species Protection Program is expected to become final in the future and at that time the Agency will determine if it impacts chemicals such as 1,4-bis(bromoacetoxy)-2-butene.

4. Value of Information

Acute toxicity testing with estuarine/marine fish using the TGAI is required for 1,4-bis (bromoacetoxy)-2-2 butene. This data set is a requirement under Part 158, Subpart W and is required for labeling purposes. The Agency will consider the data as Confirmatory Data.

Data Requirements For 1,4-Bis(Bromoacetoxy)-2-Butene

Data Requirements	Composition	Does EPA Have Data To Satisfy This Requirement?	MRID	Must Additional Data Be Submitted Under FIFRA3(c)(2)(B)?
71-1(a)/850.2100 Acute Avian Oral, Quail/Mallard	TGAI	Yes	432142-01	No
71-2(a)/850.2200 Acute Avian Diet, Quail/Mallard	TGAI	Yes	432142-02	No
71-4/850.2300 Avian Reproduction (Preferably Mallard and/or Quail)	TGAI	No	_____	No
72-1(a)/850.1750 Acute Fish Toxicity, Rainbow Trout	TGAI	Yes	431910-01	No
72-1(a)/850.1750 Acute Fish Toxicity, Rainbow Trout	TEP	No	_____	No
72-1(a)/850.1750 Acute Fish Toxicity, Bluegill	TGAI	Yes	432301-01	No
72-1(a)/850.1750 Acute Fish Toxicity, Bluegill	TEP	No	_____	No
72-2/850.1010 Acute EC50 Freshwater Invertebrate Toxicity, (Daphnia)	TGAI	Yes	432045-01	No
72-3/850.1025; 850.1035; 850.1045;850.1055; 850.1075 Acute Estuarine/Marine Organisms Toxicity	TGAI	No	_____	Yes*
72-3/850.1025; 850.1035; 850.1045;850.1055; 850.1075 Acute Estuarine/Marine Organisms Toxicity	TEP	No	_____	No
72-4(a)/850.1300 Fish Early Life Stage	TGAI	No	_____	No
72-4(b)/850.1400 Aquatic Invertebrate Life Cycle (Daphnia)	TGAI	No	_____	No
72-5/850.1500 Fish Life Cycle	TGAI	No	_____	No
72-6/850.1710; 850.1730; 850.1850 Aquatic Organism Bioavailability/Biomagnification/Toxicity Tests	TGAI	No	_____	No
72-7/850.1950 Simulated or Actual Field Testing for Aquatic Organisms	TGAI	No	_____	No
73-1/850.1735 Whole Sediment, Acute Freshwater Invertebrates	TGAI	No	_____	No
73-2/850.1740 Whole Sediment, Acute Marine Invertebrates	TGAI	No	_____	No
73-3/???? Acute Pore Water, Fish and Invertebrates	TGAI	No	_____	No
74-1/???? Whole Sediment, Chronic Invertebrates	TGAI	No	_____	No
123-1/850.4225 Seedling Emergence, Dose Response	TEP	No	_____	No
123-1/850.4250 Vegetative Vigor, Dose Response	TEP	No	_____	No
123-2/840.4400; 840.5400 Aquatic Plant Growth, Algal and Aquatic Plant Toxicity (Tier II)	TEP	No	_____	No

*****The data are a requirement under Part 158, Subpart W and are required for labeling purposes. This data set will be considered as Confirmatory Data.

Referenced Citations

Bettencourt, Michael J. 1994. BBAB - Acute Toxicity to Bluegill Sunfish, (*Lepomis Macrochirus*) Under Flow-through Conditions. Guideline 72-1(a). SLI Study #995.1193.6172.105. Submitted by Springborn Laboratories, to Buckman Laboratories International. MRID# 432301-01

Bettencourt, Michael J. 1994. BBAB - Acute Toxicity to Rainbow Trout (*Oncorhynchus mykiss*) Under Flow-through Conditions. Guideline 72-1(c). SLI Study #995.1193.6173.108. Submitted by Springborn Laboratories, to Buckman Laboratories International.
MRID# 431910-01

Putt, Arthur E. 1994. BBAB - Acute Toxicity to Daphnids (*Daphnia magna*) Under Flow-through Conditions. Guideline 72-2. SLI Study #995.1193.6174.115. Submitted by Springborn Laboratories, to Buckman Laboratories International. MRID# 432045-01

BBAB: An Acute Oral Toxicity Study with the Mallard. Wildlife International LTD. Project No.: 210-121. FIFRA Guideline 71-1. 1994. Submitted to Buckman Laboratories International, Inc. MRID# 432142-01

BBAB: A Dietary LC50 Toxicity Study with the Mallard. Wildlife International LTD. Project No.: 210-120. FIFRA Guideline 71-1. 1994. Submitted to Buckman Laboratories International, Inc. MRID# 432142-02